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Remarks

Restriction under 35 U.S.C. §121

Restriction to one of the following inventions has been required under 35 U.S.C. §121:

- I. Claims 1-35, drawn to a stent;
- II. Claims 36-58, drawn to a method; and
- III. Claims 59-63, drawn to a method.

During a telephone conversation September 21, applicants provisionally elected without traverse to prosecute the invention of group III, claims 59-63. Applicants hereby affirm the election of group III, claims 59-63. Claims 1-58 have been canceled without prejudice. Applicants reserve the right to prosecute these claims in a continuation or divisional application.

Rejections

35 U.S.C. §103(a)

Claims 59 and 63

Claims 59 and 63 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Andreacchi (US Patent No. 6,679,980) in view of Chen et al. (US 2002/0130049).

The Office Action asserts that Andreacchi teaches a method for electropolishing a stent comprising providing a tubular member and laser cutting a stent pattern (col. 6, lines 11-13) and electropolishing the stent in an acidic electrolyte (col. 7, lines 47-65).

The Office Action admits that Andreacchi fails to teach subjecting the bath to a multiple pulse waveform and using an electrolyte containing a chelating agent. The Office Action asserts that Chen et al. teach electropolishing a substrate in an acidic electrolyte which also contains a chelating agent (paragraphs 125 and 134) and subjecting the electrolyte to a multiple pulsed waveform (paragraph 143).

Claim 59 has been amended to incorporate the limitations recited in claim 60, and is directed to a method of cleaning or electropolishing a stent including the steps of providing a tubular member, laser cutting a stent pattern in the tubular member to form a stent, electropolishing the stent in an aqueous acidic mixture comprising at least one chelating or

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complexing agent, *the chelating agent including at least one sulfur atom*, and subjecting the acidic mixture to a multiple pulse waveform.

Andreacchi discloses an apparatus for electropolishing a metallic device utilizing a novel cathode design. Andreacchi fails to disclose a process for cleaning or electropolishing a stent as recited in independent claim 59 wherein an electropolishing solution includes at least one chelating agent having at least one sulfur atom in an aqueous acidic mixture and the acidic mixture is subjected to a multiple pulse waveform.

Chen et al. discloses methods and apparatus for planarizing a substrate surface with reduced contact pressure between a substrate and a polishing apparatus. Chen et al. also fails to disclose an electropolishing solution which includes a chelating agent having at least one sulfur atom.

As neither Andreacchi nor Chen et al. disclose the use of a chelating agent having at least one sulfur atom for use in an electropolishing solution, the combination fails to render claim 59, as amended, obvious. Thus, claim 59 is patentably distinct over this combination of references. Claim 63 depends from claim 59 and is patentable for at least the reasons that claim 59 is patentable.

Applicants respectfully request withdrawal of the rejection of claims 59 and 63 under 35 U.S.C. §103(a) as being unpatentable over Andreacchi (US Patent No. 6,679,980) in view of Chen et al. (US 2002/0130049).

New claims 64-74 have been added which depend from claim 59 and recite more specific chelating agents. Support for claims 64-66 can be found at least from page 10, lines 28-35 and page 11, lines 1-5 of the specification as well as from U.S. 5,560,814, the entire content of which is incorporated by reference on page 10, lines 3-5 of the present specification.

Support for new claims 67-74 can be found at least from page 4, lines 2-20 as well as from the claims as originally filed.

No new matter has been added.

Claims 60 and 62

Claims 60 and 62 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Andreacchi in view of Chen et al. as applied to claim 59 above and further in

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view of Wallace et al. (US 2005/0121390).

Claim 59 has been amended to incorporate the limitations of claim 60 as discussed above and is patentable over Andreacchi in view of Chen et al. for the reasons provided above.

The Office Action asserts that "Wallace et al. teach a method for recovery of precious metals wherein thiourea (a sulfur-containing compound) is used as the chelating agent (paragraph 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Andreacchi in view of Chen et al. by using thiourea as the chelating agent as disclosed by Wallace et al. because Wallace et al. teach that thiourea is a good chelating agent for stable metals such as gold (paragraph 4).

Applicants disagree.

Applicants submit that Wallace et al. disclose a method of separating and recovering precious metals in ionic form from industrial process solutions, particularly gold (see paragraphs [0001] and [0002]). The method includes the step of contacting the solution containing the precious metal with a conducting polymer (paragraph [0015]). The separation and/or recovery is by precipitation of the precious metal (paragraph [0018]). The process involves immersing the conducting polymer in a gold-containing solution. Gold is deposited onto the conducting polymer surface. As discussed by Wallace et al., deposition of gold onto the polymer surface is limited by the polymer surface area (paragraphs [0012] and [0013]).

The process of Wallace et al., is therefore to increase the amount of gold recovered from industrial processes solutions whereby the gold is *precipitated* from solution and deposited onto a conducting polymer surface.

Andreacchi and Chen et al., on the other hand, are directed to processes involving electrochemical steps in which the surface of a metal substrate is smoothed or otherwise improved, by removing undesirable surface characteristics. For example, during the manufacture of stents, the stent pattern is often created by laser cutting a pattern into a tubular member. This process can leave behind surface debris and slag due to the high temperature cutting process. Consequently, in order to smoothen the surface of the stent, electropolishing is often used. Electropolishing is a process whereby surface metal is *dissolved*. As electropolishing is a process that actually removes metal from the surface, it is sometimes referred to as "reverse plating".

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See Andriacchi, Background of the Invention.

Applicants submit that in order to maintain a 35 U.S.C. §103(a) rejection based on a combination of references, there must be some motivation to combine the references. "A showing of a suggestion, teaching, or motivation to combine the prior art references is an essential component of an obviousness holding." *C.R. Bard, Inc. v. M3 Sys. Inc.*, 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998).

Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention." *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 546, 48 USPQ2d 1321, 1329 (Fed. Cir. 1998). There must be a teaching or suggestion within the prior art, within the nature of the problem to be solved, or within the general knowledge of a person of ordinary skill in the field of the invention, to look to particular sources, to select particular elements, and to combine them as combined by the inventor. See *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 665, 57 USPQ2d 1161, 1167 (Fed. Cir. 2000); *ATD Corp.*, 159 F.3d at 546, 48 USPQ2d at 1329; *Heidelberger Druckmaschinen AG v. Hantscho Commercial Prods., Inc.*, 21 F.3d 1068, 1072, 30 USPQ2d 1377, 1379 (Fed. Cir. 1994) ("When the patented invention is made by combining known components to achieve a new system, the prior art must provide a suggestion or motivation to make such a combination.").

Crown Operations International Ltd. v. Solutia Inc., 62 USPQ2d 1917, 1922 (Fed. Cir. 2002).

Applicants submit that there is no motivation to combine the gold recovery process based on precipitation of gold from solution and deposition of gold onto a conducting polymer surface, whereby the reference suggests improving the recovery by increasing polymer surface area, with the electropolishing processes of either Andriacchi or Chen et al. wherein it is desirable to smoothen a metal surface, a process which involves dissolution of metal from the surface of the metal stent.

Applicants respectfully request withdrawal of the rejection of claims 59 and 63 under 35 U.S.C. §103(a) as being unpatentable over Andriacchi in view of Chen et al. as applied to claim 59 above and further in view of Wallace et al. (US 2005/0121390).

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Claim 61

Claim 61 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Andreacchi in view of Chen et al. as applied to claim 59 above and further in view of Edson (US Patent No. 4,663,005). The Office Action asserts that Andreacchi and Chen et al. teach the features previously described, Andreacchi further teaching the stent soaked in an acidic solution containing nitric acid (column 6, lines 26-45).

The Office Action admits that Andreacchi and Chen et al. fail to teach that the solution also contains fluoroboric acid. The Office Action asserts that Edson teaches electropolishing for metals such as copper, gold and silver, which uses fluoboric acid which is synonymous with fluoroboric acid, in the electrolyte (col. 3, lines 44-47). The Office Action asserts that it would have been obvious to modify the method of Andreacchi in view of Chen et al. by incorporating fluoroboric acid in the soaking solution as disclosed by Edson, because Edson teaches this acid activated thiourea (see abstract).

Applicants traverse the rejection.

Claim 59 has been discussed above and is patentable over the combination of Andreacchi and Chen et al.

Claim 61 depends from claim 59 and is directed to an embodiment wherein the stent is soaked in an acidic mixture of fluoroboric and nitric acids.

Andreacchi disclose a method of electropolishing stents wherein the stent is made from a metal alloy taken from the group of metal alloys including stainless steel, cobalt-chromium, cobalt-chromium-tungsten, nickel-titanium, titanium, tantalum, and tungsten (claim 8).

Andreacchi state at col. 3, lines 9-15, that:

Electropolishing in the *proper* electrolytic solution, can serve to smooth out the exposed rough surface to the point where it is ultrasmooth, shiny, and reflective. However, heretofore there has been no effective method to consistently produce an ultrasmooth, shiny finish on the surface a stent comprised of any metal or metal alloy such as cobalt-chromium alloys.

Col. 3, lines 9-15 (*emphasis added*)

This statement suggests that not every solution will work as well for every metal or metal alloy.

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The electropolishing solutions of Andreacchi include hydrochloric acid (HCl) and sulfuric acid (H₂SO₄). Andreacchi fails to disclose either fluoroboric or nitric acid as recited in claim 61.

Chen et al. disclose a method and apparatus for planarizing a material layer on a substrate. In one aspect, the method includes forming a passivation layer on a substrate surface, polishing the substrate in an electrolyte solution, applying an anodic bias to the substrate surface, and removing material from at least a portion of the substrate surface (Abstract). Chen et al. disclose various electrolyte solutions in paragraphs 125 and 126. Chen et al. fail to disclose either fluoroboric or nitric acid.

Edson is directed to an electrolytic process employing a non-toxic electrolytic solution for anodically producing a high surface luster on *copper, silver, gold and alloys of the same*. The solutions of Edson include methane sulfonic acid, sulfuric acid, hydrochloric acid, phosphoric acid, fluoboric acid and succinic acid.

However, because Andreacchi disclose only the use of sulfuric or hydrochloric, and disclose that the proper electrolyte solution is important in smoothing out the surface to the point where it is ultrasmooth, shiny, and reflective, of metals or metal alloys such as cobalt-chromium alloys, there would be no reason to suspect that any of the other acids disclosed by Edson, would be useful in obtaining an ultrasmooth, shiny and reflective surface in metal alloys such as cobalt-chromium alloys. Consequently, Applicants submit that there would be no motivation to combine the teachings of Edson, with Andreacchi, as Edson is directed to copper, silver and gold and alloys of the same, and Andreacchi is silent as to employing their method with copper, silver, gold and alloys of the same.

Thus, as neither Andreacchi nor Chen et al. disclose the use of nitric or fluoroboric, and since there is no motivation to combine Edson with Andreacchi, Applicants submit that the combination fails to render claim 61 obvious.

Applicants respectfully request withdrawal of the rejection of claim 61 under 35 U.S.C. §103(a) as being unpatentable over Andreacchi in view of Chen et al. as applied to claim 59 above and further in view of Edson (US Patent No. 4,663,005).

CONCLUSION

Claims 59 and 61-74 are pending in the application. Applicants have addressed each of the issues presented in the Office Action. Applicants respectfully request reconsideration and an early allowance of the claims as presented. Should any issues remain, the attorney of record may be reached at (952)563-3011 to expedite prosecution of this application.

Respectfully submitted,

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